“Complexation of U(VI) with HEDPA in neutral and alkaline solutions”

W. A. Reed[a], A. Yu. Garnov[a], L. Rao[a] , P. Zanonato[a], and K. L. Nash[b]

[a] *Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA 94720*
[b] *Chemistry Division, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne,IL*

Diphosphonic acid ligands such as HEDPA (1-hydroxyethane-1,1-diphosphonic acid) have been found to have superior complexation properties in acidic media over carboxylic acids. Consequently, they have been incorporated in a number of actinide separation processes: for example, surface decontamination and solvent extraction. Though these systems are well understood in the acidic region, relatively little work has been carried out with regards to the interaction between these ligands and metals in neutral and alkaline solutions. Recently we have started studies on the coordination of HEDPA with uranyl(VI), with emphasis on the complexation in neutral to basic solutions. Thermodynamic results from potentiometry and calorimetry and structural information from spectroscopic techniques are presented.

This work was supported by the Assistant Secretary for Environmental Management, US Department of Energy under contract number DE-AC03-76SF0098 at Lawrence Berkeley National Laboratory.